

2003 Climate Workshop

Notes / Overview of the talks during the morning session

Tuesday, 9/16/03

Climate Services – NWS / NOAA Vision - Fiona Horsfall (CSD)

The NWS Climate Services Definition – The timely production and delivery of useful climate data, information, and knowledge to decision makers.

The NWS Climate Services Vision:

- 1) Real-time monitoring of climate variability, coast to coast, down to the county level.
- 2) New forecast products (including downscaling)
- 3) A user-friendly provider to the private sector.
- 4) Insure accuracy and continuity of the U.S. historical record
- 5) Involve the regional and field offices for: outreach, downscaling, dissemination, quality control of observations.

NWS Climate Services Mission – To provide vision, direction, and resources to ensure NWS climate services are easily accessible, well understood, optimally used and reflect customer needs.

Climate Services Key Internal Activities – Statistical downscaling of CPC outlooks for Western Region, Alaska and Eastern Region, definition of new homogeneous Climate Division for the U.S., development of an organizational model for regional climate services.

WSH Climate Service Division is there to help us, by providing staff and monetary assistance, guidelines and directives. The Implementation Plan has been published, and explains what the regional and field offices roles are.

Role of Regional and Field Offices:

1. Organize and equip the regional and local offices with guidelines and tools to enhance climate services.
2. Provide reliable, timely, accurate and secure observations and metadata for the climate record. “Our legacy will be our data”.
3. Enhance and extend CPC’s product suite to increase the use and effectiveness of regional and local climate information.
4. Conduct outreach to regional and local decision makers and users of climate services products.
5. Establish strong partnerships with the climate community.

Regional Integrated Sciences and Assessment (RISA) offices find out what products the customer needs.

Applied Statistics for Climatology - Marina Timofeyeva (CSD)

Brief introduction to NCDC web page.

Several basic statistics defined:

Mean (average)

Variance (spread)

Standard deviation (spread, a function of the variance).

Median (middle value)

Mode (most frequent value)

Skewness (asymmetry)

Kurtosis (peakedness).

Filters – used to separate different signals from a time series (for example, applying a high pass filter to a year of temperature data will display the low frequency (seasonal) fluctuations, while a high pass filter displays higher frequency (day-to-day) fluctuations.).

Correlation – the linear statistical relationship between two random variables.

Autocorrelation – the linear statistical relationship between a variable, and the same variable sampled at a different time.

Climate Variability / ENSO - Gerry Bell (CPC)

Long range forecasts often rely on determining the states of ENSO (El Nino / La Nina) and longer frequency (decadal) signals.

For example, El Nino conditions in the 1970s often meant very few Atlantic hurricanes. El Nino conditions currently can be associated with more Atlantic hurricanes – the decadal signal has changed since the 1970s.

North Atlantic Oscillation – negative favors cold eastern North American and European winters, positive favors mild eastern North American and European winters. NAOs were mostly negative in the 50s and 60s, mostly positive in the 80s and 90s.

Enso effects North American weather by affecting the amount of tropical convection over the tropical Pacific Ocean. The amount of convection over the tropical Pacific ocean

affects the strength and horizontal extend of the east Asian jet stream, which has downstream effects over North America.

El Nino is associated with an enhanced east Asian jet extending far to the east (exit region just west of the U.S. west coast). La Nina is associated with a weaker east Asian jet (exit region west of the date line).

Tropical multi-decadal mode is defined – based on the amount of upper level divergence over the tropics – negative in the 50s and 60s, positive in the 80s and 90s. Hurricanes are more favored during the negative phase.

Conditions most favorable for hurricanes is La Nina with a negative tropical multi-decadal mode.

Climate Downscaling Techniques - Marina Timofeyeva (CSD)

Normally there are 9 to 10 climate divisions per state. Some states (NJ, ME) have only 3. Currently, CDC has 102 climate divisions across the U.S.

Climate record for individual stations within each climate division does not always match well with the record for the climate division as a whole.

Downscaling is an effort to take information for a climate division, and apply it to individual stations within the climate division.

Specifically, downscaling can be used to translate the probability of exceedence (POE) outlooks for various weather elements from climate divisions to individual stations.

Step one – define stations where the station outlooks are used.

Step two – define regression equations showing relations between weather data at the stations and weather data for the entire climate division.

Step three – test / verify the regression equations.

Another technique is the composite technique: Probabilities of above normal, normal and below normal are calculated based on previous weather for similar ENSO conditions. Long-term (decadal) trend can also be considered.

Messages to take home : There are no nws consistent local climate products available now. Downscaling can be used as a tool for local climate products. The local climate product should be consistent with the national weather service products (CPC). CPC methods could be used in developing such local climate products. In developing of downscaling at least three nws should be involved: regional office, CSD and CPC.

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Snowfall Requirements, Data, Transition - Alan Dunham (BOX)

Encourage spotters, TV meteorologists to educate on how to properly measure snowfall. Do not clear snowboard. Contract weather observers not allowed to provide snow data this year (FAA decision).

Team studied options to provide snow observations. Best option is paid contract observers (\$20 + 4 synoptic observations per day). NWS will decide location. Snow water equivalent will be included.

Master educational effort must be done from WSH, Regions, and local offices to customer. Educate customers on problems of snowfall measurements. They will be more sympathetic and may have ideas for improvement.

LCD sites are what we are talking about. This is our customers requirement.

COOP Modernization & New England Project -Ken Crawford (Sr. Scientist OS&T)

COOP modernization and the New England Project. Building the National Cooperative Mesonet - Ken Crawford, OS&T

Plan: COOP modernization should be complete 5 years after modernization begins.

Program Development Plan not signed yet - may be 2 months away.

Vision: integrate existing mesonets into a centralized location (backbone).

Baseline will be precipitation and temperature. Subgroup of enhanced sites will have more.

Partners to include: USDOT, USDA, State Governments, and others.

Type of precipitation gage has not been decided.

Contractor maintained.

Snowfall done by humans - not to be automated.

11,500 current COOPs. 8,000 planned for modernization.

Quality control to take place at WFOs, RFCs, and at a centralized facility with post-QC by NCDC.

Jack Hayes and Jack Kelly have said they will establish a Program Office for COOP modernization.

Tiger Team membership - Ken C. Will make sure to include a field person.

Ken welcomes honest input and feedback. Email him.

Data Quality Control - Jim Campbell (RLX)

COOP Quality Control: interactive QC of COOP reports.

This is an operational AWIPS-based software to QC data. 3-4 Eastern Region offices utilize this.

ROSA communications not always reliable - susceptible to lightning.

Subject to errors in process.

Software allows easy manipulation of questionable data on graphical screens.

QCMS Browser: QC and monitoring system.

QCs ASOS, Buoy, AWOS, METARS. Only some parameters.

Again - integrated into D2D components on AWIPS.

Focus is “mesoanalysis.” (Changed locally only.)

Limited use because of limited parameters - future uncertain; \$\$ funding dependent.

Data Quality Control - Jeanne Wallace (NERFC)

QC of data at the RFC level, after initial QC at WFO level.

Data arrives 24/7 at WFO/RFC levels.

Data includes precipitation, snow, temperatures river/reservoir stages. Sources: COOPs, satellite, LARCs, metars, -88D radar.

Can graphically view and edit all types of data.

Outlined various types of applications - time series, MPE.

Snow data QC: different criteria. SWE - 2 week period.

NOHRSC Airborne SWE data utilized.

RFC produces precipitation products - monthly, seasonal, etc.

RFC web pages include precipitation and snow data.

All data utilized to produce river forecasts.

Standardization between RFC products? AHPS pages are standardized, but other mapping not yet. It will be in future - matter of prioritizing.

NCDC - Products, Data, QC, etc - Stephen Del Greco (NCDC)

Outlined mission, scope, etc.

Partnerships: State/Regional - State Climatologists. National - NOAA, DOT. International - WMO, UNESCO, etc.

3 Tiered Procedure - Goals: high quality data, educate public, and research.

CDMP: Climate Database Modernization Program. Data rescue - digitizing old data (Pre 1948).

Future tasks discussed.

WSSRD: online interface.

75% of QC is automated; 25% is manual.

Website: <http://www.ncdc.noaa.gov/oa/hofn/index.html>

very informative - possible usage for site selection in COOP modernization process.

ACTION: provide field offices with interface/access: NCDC, NWS_xxx, etc.

Processing Data Sets: assimilation, QC, dissemination. All from various networks into one. Standardize once only!

Will have no longer need for preliminary LCDs - will be update daily.

Discussion on data policy for web. Value added: no NWS data: yes.

ACTION: Review policy of NCDC publication policy 10-1003.

RCC - Products, Data, QC, etc (NRCC - Keith Eggleston)

One of six national climate centers.

Began in 1978; NWS since 1991; NCDC since 1997 (management)

Outlined personnel - including several students each year.

Mission: disseminate quality data.

Services: many customers. User defined - NWS can be customers too.

Users: Legal, Insurance, Engineers lead the pack.

ACIS (Applied Claims Information System) - new.

CLIMOD: web access to climate products and data for the entire country.

ACTION: NWS offices call to set up an account.

Mapping Products: 38 updated daily.

Specialized Products: Wind rose etc; turfgrass.

Ongoing Projects: several noted. Real time info: lawn watering project!

Research: many result from requests.

RCC/NWS Partnership: improve quality and quantity of data.

State Climatologist(s) - Products, Data, QC, etc (AASC President - David Robinson)

Varies from state to state. Some with full web presence; others not. All but WV, RI, MT.

Team up partnerships with RCCs, NCDC, etc.

No need to worry about daily data input etc. More general - able to tailor regional data to specific states.

Showed various mesonets - combining to SafetyNet.”

Partnerships - Universities, Utility Companies - offsets costs of maintenance of WxNets.

Historic Perspectives - early observers 17th, 18th century.

Outreach - major activity. Some data requests. 30 newspapers, 15 TV stations, etc.

Many state climatologists are only part time. They are often university employed, etc.

NCDC - RCC - State Climatologists: redundancies - meeting held 4/03 to streamline responsibilities.

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Brief Discussion on NCDC Products and Services - William Angel (NCDC)

Handouts on WSSRD, web sites, etc.

Information on NCDC services.

Media Use of Climate Data - Matt Noyes (New England Cable News)

Discuss use of climate products.

Contact: mnoyes@necn.com

Invitation to contact Matt if New England Sites wish to get information out.

CPC most used site for climatic information. 8-14 day forecast not commonly used.

Wide variety of users - city versus rural.

Climatic messages in advance of significant events useful (before news reporters).

Ease of understanding and readability critical.

8-14 day lacks quantitative data - CPC will add 50% probability.

Hazardous Assessment valuable but scale is too broad, a Regional Hazardous Assessment would be more useful. Can this graphic be more interactive?

AFD notifying users of ASOS limitations and/or outages would be very useful.

Strong desire to see the NWS take the lead over private providers, especially in synoptic scale discussions.

Matt will share Email comments on climatic information (particularly CPC) with Bob Leffler (CSD).

Fiona Horsfall: NWS shortly coming out with the El Nino index press release.

CPC - Products, Data, QC, etc. - Ed O'Lenic (CPC)

Invitation to Matt Noyes to give talk to CPC both for input and motivation.

Discussion of climatic definitions.

Trade winds drive warmer water west in the Pacific.

CPC does not routinely look at local Hazardous Weather Outlook (HWO) messages.

CPC updates Hazardous Weather Outlook Assessment graphic on Tuesday with necessary minor changes made daily through Friday.

Little or no confidence in forecasting the “near normal” category.

Graphic reveals that increased resolution to improving model output. Interestingly enough, removing topography does.

CPC will be going to total probability rather than anomalies on seasonal outlooks.

Forecast confidence very low in New England. (Aside comment, SPC usually feels the same way!)

Graphic showing three winters with similar below normal temperatures in east with three different ENSO signatures - NAO the tool to better forecasts.

COOP stations and climatic divisions used to determine climatic trends.

Suggestion to provide skill scores by state and station.

Web site will be made more user friendly.

Climatic Services Partnerships - Judy Koepsell (CSD)

Kudos from Judy on quality and types (particularly including the media) of presentations, and how we dealt with the wrinkles presented by Hurricane Isabel.

Climatic services hierarchy -----

1. Partnerships (The glue that holds everything together)
2. Guidelines and tools.
3. Observations and data.
4. Climate monitoring and prediction products.
5. Education and outreach.

MOUs are not presently required of participants in the CSD partnership program.

Two opportunities for program involvement each month.

Program will continue in 2004.

Application is done online with any requests for information from CSD by phone and Email. Essay portion of application is most important.

Review of directives (NWS) associated with climate (1000-1004) can be located on CSD web page.

Partnerships move from the field up through Regional Headquarters to CSD.

Local Climate Partnerships - Clyde Locklear (WFO RAH) & Ryan Boyles (NC State Climatologist)

Being co-located makes partnerships easier and more functional.

Baseline level of service being set up by AASC for each state office.

Emphasis on high quality data with stewardship from the NWS.

NC ECONet (mesonet) data is pumped into AWIPS.

Attempts made to take national CPC outlooks and bring them down to the State level. Explanations provided on how to interpret the data.

Funding for NC state climatologist comes from NC State meteorology and agriculture departments.

Time to perform climate duties is limited - (RAH about 2-3 shifts a month).

Action Items:

(Sergio)

- Work with Greg Bell to ensure more information about climate variability is distributed to the regional and field offices.
- Work with the field offices to set up their CLIMOD accounts with NRCC. SE RCC also offered their services..
- New England Project update to the State climatologists. Work on partnerships - possible QC of data.
- Provide a link to AASC for ERH climate Page.
- Work with NCDC and the field offices so all can use MI3, SIRIS, WSSRD.

(Bob Leffler)

- ERH and WFO web sites should be compliant with data dissemination policy as stated in NWS Policy directive 10-1003.
- WSH to obtain copy of Matt Noyes climate services questionnaire results and evaluate them for consideration in the context of NWS climate services improvements.
- CPC needs to provide some products in easier to understand formats (e.g., Probability of Exceedance graphs). Ed O'lenic stated that this concern is recognized and they plan to look at options.
- NWSH and Regional CSPM need to incorporate the DAPM's role into the National climate Services Plan in section (page 7?).
- CPC needs to:
 - >Produce a to percent probability graphic of prediction anomalies
 - >Produce anomalies in absolute degrees (temperature) in addition to probabilistic terms (50 percent)